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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,240	08/01/2006	Takashi Abe	5453-061931	8244
28289 7590 12/18/2007 THE WEBB LAW FIRM, P.C. 700 KOPPERS BUILDING 436 SEVENTH AVENUE PITTSBURGH, PA 15219				
EXAMINER				
ANGWIN, DAVID PATRICK				
ART UNIT		PAPER NUMBER		
4155				
MAIL DATE		DELIVERY MODE		
12/18/2007		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/588,240

Applicant(s)

ABE ET AL.

Examiner

DAVID P. ANGIN

Art Unit

4155

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8500)
- Paper No(s)/Mail Date 11/13/06
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). A certified copy was received by this office on 8/1/06.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 11/13/06, was received. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner.

Claim Rejections – 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) that forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically taught or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dutton et al* (US Patent 6,682,657) in view of *Outsuka et al* (JP Patent 2003-168941).

- a. *Dutton et al* discloses the following in his reference:
 - i. applying a masking agent to a surface of a substrate material to be processed (Figs. 1a-1e, item 1);
 - ii. shaping a film of the masking agent to a predetermined masking pattern (Figs. 1c-1e, masking agent is made smaller);
 - iii. holding the film in contact with a solvent (2:63-3:6; *the examiner notes that resist etch is a known solvent*) for the masking agent, so as to fluidize the film (2:47-51) to a domed shape on the surface of the substrate material (Figs. 1a-1e, item 1); and
 - iv. processing the substrate material to a three-dimensional convex profile corresponding to thickness distribution of the domed shape (Figs. 1a-1e, substrate material shaped like a dome).
- b. *Dutton et al* does not expressly disclose the following in his reference:
 - i. the substrate is made of a piezoelectric material.
- c. However, *Outsuka et al* teaches the following in his reference:
 - i. the substrate is made of a piezoelectric material (Figs. a-f, item 1; [0009-11], described as "piezo-electric matter plate").

- d. The advantage of etching piezoelectric material is to utilize a well known material removal process to shape a material that has many alternative electrical and mechanical uses.
- e. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace:
 - 1. a substrate material that is not expressly disclosed by *Dutton et al*; with
 - 2. a substrate made of piezoelectric material as taught by *Outsuka et al*;to utilize a well known material removal process to shape a material that has many alternative electrical and mechanical uses.

Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dutton et al* (US Patent 6,682,657) in view of *Outsuka et al* (JP Patent 2003-168941) as applied to claim 1 and further in view of *Aoki* (US Patent 5,646,657).

- a. *Dutton et al* as modified by *Outsuka et al* as applied to claim 1 does not expressly disclose the following:
 - i. the surface of the piezoelectric material is partially treated with an oil repellant.
- b. However, *Aoki* teaches the following in his reference:

- i. the resist contains an oil repellant (4:4-15).
- c. The advantage of treating the surface of the piezoelectric material with an oil repellant is to prevent oil and oil-based liquids from entering the material surface and changing the etch rate of the piezoelectric material.
- d. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify:
 - 1. a method of etching a piezoelectric material that does not expressly discuss treating the surface of the piezoelectric material with an oil repellant as disclosed by *Dutton et al* as modified by *Outsuka et al* as applied to claim 1; with
 - 2. a method of etching a piezoelectric material that discloses treating the surface with an oil repellant as taught by *Aoki*;to prevent oil and oil-based liquids from entering the material surface and changing the etch rate of the piezoelectric material.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Angwin whose telephone number is (571)270-3735. The examiner can normally be reached on 7:30 AM - 5 PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Victor Batson can be reached on 703-272-6987. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor Batson/
Victor Batson
Supervisory Patent Examiner
Art Unit 4155

DPA